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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/936,616	09/17/2001	Kazuyuki Miya	L9289.01188	9084

24257 7590 08/12/2004

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EXAMINER	
MILLER, BRANDON J	

ART UNIT	PAPER NUMBER
2683	

DATE MAILED: 08/12/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/936,616	Applicant(s) MIYA, KAZUYUKI	
	Examiner Brandon J Miller	Art Unit 2683	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-9 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-9 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 5.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whinnett in view of Fukawa.

Regarding claim 1 Whinnett teaches a radio base station apparatus (see col. 2, lines 30-41). Whinnett teaches antenna array receiving for carrying out antenna array reception processing on a signal from a communication terminal apparatus (see col. 2, lines 54-67 and col. 3, lines 1-8). Whinnett teaches generating a reference signal of a signal from the communication terminal apparatus from demodulated data (see col.10, lines 16-39 & 65-67). Whinnet teaches controlling reception weights used for antenna array reception processing using a difference between the signal subjected to antenna array reception processing and a reference signal (see col. 1, lines 36-52 and col. 2, lines 56-62). Whinnett does not specifically teach an adaptive array antenna, an interference canceller that carries out interference cancellation processing on the signal subjected to adaptive array antenna reception processing, or generating a reference signal after being subjected to interference cancellation processing. Fukawa teaches an adaptive array antenna (see col. 4, lines 16-18). Fukawa teaches an interference canceller that carries out interference cancellation processing on a signal subjected to adaptive array antenna reception processing (see col. 1, lines 5-10 and col. 6, lines 22-31). Fukawa teaches generating a signal

after being subjected to interference cancellation processing (see col. 6, lines 30-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include an adaptive array antenna, an interference canceller that carries out interference cancellation processing on the signal subjected to adaptive array antenna reception processing, and generating a reference signal after being subjected to interference cancellation processing because this would allow for an improved adaptive antenna array that keeps reception/transmission performance from degradation.

Regarding claim 2 Whinnett and Fukawa teaches a device as recited in claim 1 except for an interference canceller that comprises carrying out channel estimation using the signal from the communication terminal apparatus and generating a replica signal using the signal from the communication terminal apparatus, the replica generating means generates a reference signal using the channel estimated value. Whinnett does teach carrying out channel estimation using a signal from a communication terminal apparatus (see col. 14, lines 54-60). Whinnet does teach generating a reference signal (see col. 13, lines 57-61). Fukawa does teach an interference canceller (see col. 1, lines 5-10 and col. 6, lines 22-31). Fukawa does teach generating a replica signal using a signal from a communication terminal apparatus (see col. 10, lines 1-7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include an interference canceller that comprises carrying out channel estimation using the signal from the communication terminal apparatus and generating a replica signal using the signal from the communication terminal apparatus, the replica generating means generates a reference signal using the channel estimated value because this would allow for an

improved base station capable of preventing deterioration of reception power of desired radio waves.

Regarding claim 3 Whinnett and Fukawa teach a device as recited in claim 1 except for carrying out error correction processing on the demodulated data after interference cancellation processing, wherein the reference signal generating means generates a reference signal using the output of the error correction processing. Whinnett does teach carrying out error correction processing on data (see col. 6, lines 9-23). Whinnett does teach processing demodulated data (see col. 10, lines 60-66). Whinnett teaches generating a reference signal (see col. 7, lines 39-47). Fukawa does teach carrying out error processing after interference cancellation processing (see col. 1, lines 5-10 and col. 6, lines 22-40). Fukawa does teach generating a signal using the output of the error correction processing (see col. 10, lines 5-10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include carrying out error correction processing on the demodulated data after interference cancellation processing, wherein the reference signal generating means generates a reference signal using the output of the error correction processing because this would allow for an improved base station capable of preventing deterioration of reception power of desired radio waves.

Regarding claim 4 Whinnett and Fukawa teach a device as recited in claim 1 except for a plurality of communication terminal apparatuses that is divided into groups based on the directions of arrival of signals from the communication terminal apparatuses and reception weights are calculated group by group. Whinnet does teach a plurality of communication apparatuses and reception weights that are calculated for respective ones of the communication

apparatuses (see col. 2, lines 50-53 and col. 3, lines 10-15 & 53-61). Fukawa does teach a plurality of communication terminal apparatuses that is divided into groups based on the direction of arrival signals from the communication terminal apparatuses (see col. 4, lines 66-67 and col. 5, lines 1-2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include a plurality of communication terminal apparatuses that is divided into groups based on the directions of arrival of signals from the communication terminal apparatuses and reception weights are calculated group by group because this would allow for efficient processing of signals from a plurality of antennas.

Regarding claim 5 Whinnett teaches selecting a communication terminal apparatus used to generate a reference signal form among the communication terminal apparatuses that belong to a group (see col. 1, lines 36-45 and col. 7, lines 39-47).

Regarding claim 6 Whinnett teaches a radio base station apparatus (see col. 2, lines 30-41). Whinnett teaches antenna array receiving for carrying out antenna array reception processing on a signal from a communication terminal apparatus (see col. 2, lines 54-67 and col. 3, lines 1-8). Whinnett teaches carrying out error correction processing on data (see col. 6, lines 9-23). Whinnett teaches processing demodulated data (see col. 10, lines 60-66). Whinnett teaches generating a reference signal in symbol units of the signal from the communication terminal apparatus from the demodulated data (see col.10, lines 16-39 & 65-67 and col. 15, lines 10-14). Whinnet teaches controlling reception weights used for antenna array reception processing using a difference between the signal subjected to antenna array reception processing and a reference signal (see col. 1, lines 36-52 and col. 2, lines 56-62). Whinnett does not specifically teach an adaptive array antenna, carrying out error correction processing after being

subjected to interference calculation processing, an interference canceller that carries out interference cancellation processing on the signal subjected to adaptive array antenna reception processing, generating a reference signal after being subjected to interference cancellation processing. Fukawa does teach carrying out error processing after interference cancellation processing (see col. 1, lines 5-10 and col. 6, lines 22-40). Fukawa teaches an adaptive array antenna (see col. 4, lines 16-18). Fukawa teaches an interference canceller that carries out interference cancellation processing on a signal subjected to adaptive array antenna reception processing (see col. 1, lines 5-10 and col. 6, lines 22-31). Fukawa teaches generating a signal after being subjected to interference cancellation processing (see col. 6, lines 30-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include an adaptive array antenna, carrying out error correction processing after being subjected to interference calculation processing, an interference canceller that carries out interference cancellation processing on the signal subjected to adaptive array antenna reception processing, generating a reference signal after being subjected to interference cancellation processing because this would allow for an improved adaptive antenna array that keeps reception/transmission performance from degradation.

Regarding claim 7 Whinnett teaches a communication terminal apparatus carrying out a radio communication with a radio base station apparatus (see col. 2, lines 30-41). Whinnett teaches antenna array receiving for carrying out antenna array reception processing on a signal from a communication terminal apparatus (see col. 2, lines 54-67 and col. 3, lines 1-8). Whinnett teaches generating a reference signal of a signal from the communication terminal apparatus from demodulated data (see col.10, lines 16-39 & 65-67). Whinnett teaches

controlling reception weights used for antenna array reception processing using a difference between the signal subjected to antenna array reception processing and a reference signal (see col. 1, lines 36-52 and col. 2, lines 56-62). Whinnett does not specifically teach an adaptive array antenna, an interference canceller that carries out interference cancellation processing on the signal subjected to adaptive array antenna reception processing, generating a reference signal after being subjected to interference cancellation processing. Fukawa teaches an adaptive array antenna (see col. 4, lines 16-18). Fukawa teaches an interference canceller that carries out interference cancellation processing on a signal subjected to adaptive array antenna reception processing (see col. 1, lines 5-10 and col. 6, lines 22-31). Fukawa teaches generating a signal after being subjected to interference cancellation processing (see col. 6, lines 30-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include an adaptive array antenna, an interference canceller that carries out interference cancellation processing on the signal subjected to adaptive array antenna reception processing, generating a reference signal after being subjected to interference cancellation processing because this would allow for an improved adaptive antenna array that keeps reception/transmission performance from degradation.

Regarding claim 8 Whinnett teaches a radio communication method (see col. 2, lines 30-41). Whinnett teaches antenna array receiving for carrying out antenna array reception processing on a signal from a communication terminal apparatus (see col. 2, lines 54-67 and col. 3, lines 1-8). Whinnett teaches generating a reference signal of a signal from the communication terminal apparatus from demodulated data (see col.10, lines 16-39 & 65-67). Whinnet teaches controlling reception weights used for antenna array reception processing using a difference

between the signal subjected to antenna array reception processing and a reference signal (see col. 1, lines 36-52 and col. 2, lines 56-62). Whinnett does not specifically teach an adaptive array antenna, an interference canceller that carries out interference cancellation processing on the signal subjected to adaptive array antenna reception processing, generating a reference signal after being subjected to interference cancellation processing. Fukawa teaches an adaptive array antenna (see col. 4, lines 16-18). Fukawa teaches an interference canceller that carries out interference cancellation processing on a signal subjected to adaptive array antenna reception processing (see col. 1, lines 5-10 and col. 6, lines 22-31). Fukawa teaches generating a signal after being subjected to interference cancellation processing (see col. 6, lines 30-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include an adaptive array antenna, an interference canceller that carries out interference cancellation processing on the signal subjected to adaptive array antenna reception processing, generating a reference signal after being subjected to interference cancellation processing because this would allow for an improved adaptive antenna array that keeps reception/transmission performance from degradation.

Regarding claim 9 Whinnett teaches a radio communication method (see col. 2, lines 30-41). Whinnett teaches antenna array receiving for carrying out antenna array reception processing on a signal from a communication terminal apparatus (see col. 2, lines 54-67 and col. 3, lines 1-8). Whinnett teaches carrying out error correction processing on data (see col. 6, lines 9-23). Whinnett teaches processing demodulated data (see col. 10, lines 60-66). Whinnett teaches generating a reference signal in symbol units of the signal from the communication terminal apparatus from the demodulated data (see col.10, lines 16-39 & 65-67 and col. 15, lines

10-14). Whinnet teaches controlling reception weights used for antenna array reception processing using a difference between the signal subjected to antenna array reception processing and a reference signal (see col. 1, lines 36-52 and col. 2, lines 56-62). Whinnett does not specifically teach an adaptive array antenna, carrying out error correction processing after being subjected to interference calculation processing, an interference canceller that carries out interference cancellation processing on the signal subjected to adaptive array antenna reception processing, generating a reference signal after being subjected to interference cancellation processing. Fukawa does teach carrying out error processing after interference cancellation processing (see col. 1, lines 5-10 and col. 6, lines 22-40). Fukawa teaches an adaptive array antenna (see col. 4, lines 16-18). Fukawa teaches an interference canceller that carries out interference cancellation processing on a signal subjected to adaptive array antenna reception processing (see col. 1, lines 5-10 and col. 6, lines 22-31). Fukawa teaches generating a signal after being subjected to interference cancellation processing (see col. 6, lines 30-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include an adaptive array antenna, carrying out error correction processing after being subjected to interference calculation processing, an interference canceller that carries out interference cancellation processing on the signal subjected to adaptive array antenna reception processing, generating a reference signal after being subjected to interference cancellation processing because this would allow for an improved adaptive antenna array that keeps reception/transmission performance from degradation.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Miya et al. U.S Patent No. 6,470,194 discloses a base station with improved directivity using adaptive antenna array reception.

Ide et al. U.S. Patent No. 6,501,943 discloses adaptive directivity transmission device and method.

Whinnett U.S. Patent No. 6,192,256 discloses device for transmitter path weights and methods thereof.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brandon J Miller whose telephone number is 703-305-4222. The examiner can normally be reached on Mon.-Fri. 8:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on 703-308-5318. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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August 6, 2004

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